



Business Modules on Rice Transplanter, Harvester, Reaper and Seed Planter



Appropriate Scale Mechanization Innovation Hub (ASMIH)-Bangladesh

Department of Farm Power and Machinery
Bangladesh Agricultural University
Mymensingh-2202
Bangladesh



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KANSAS STATE UNIVERSITY ILLINOIS





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Preface

The Appropriate Scale Mechanization Consortium (ASMC), University of Illinois at Urbana-Champaign in consistent with the goals and objectives of Sustainable Intensification Innovation Lab (SIIL) at Kansas State University, USA funded by the Feed the Future (FtF), USAID, USA intends to introduce multifunctional and modular mechanized technologies that are technically, environmentally, and economically appropriate for use by smallholder farmers with the flexibility to accommodate different power sources in four countries of Bangladesh, Cambodia, Ethiopia and Burkina Faso. In line of the ASMC goals and objectives, the project entitled "Appropriate Scale Mechanization Innovation Hub (ASMIH) - Bangladesh" was formulated for overcoming challenges in Southern Delta of Bangladesh. Agriculture in Southern Delta is characterized by low productivity due to salinity, water logging, less access to modern technologies, inadequate control over water resources and repeated crop losses due to natural calamities. Four years project was laid out with survey, assessing and adapting technologies of transplanting, harvesting and conservation agriculture machinery, capacity building, scaling up and sharing meeting with the partners. ASMIH-Bangladesh project has identified appropriate machines such as transplanter, reaper & mini-combine harvester and seeder as solutions for transplanting, harvesting and conservation agriculture practices in southern delta of Bangladesh. These machines save labor, time and cost. The project has developed business modules on these technologies which are of great importance in imparting awareness and skills on custom hiring service business provisions to custom hiring service providers, operators, mechanics, farmers and extension agents.

The project acknowledges the Feed the Future and USAID, USA for rewarding research grant, and Sustainable Intensification Innovation Lab (SIIL), Kansas State University and Appropriate Scale Mechanization Consortium (ASMC), University of Illinois at Urbana-Champaign, USA for continuous technical and management supports. The project also acknowledges the partnerships with Bangladesh Agricultural Research Institute (BARI), ACI Motors, Metal Pvt Ltd. for providing necessary supports in developing database for preparing the manuals. Special acknowledgement to Bangladesh Agricultural University for hosting the ASMIH-Bangladesh and all out support for implementing its activities.

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Chapter 1

Business module on rice transplanter custom hiring service

This module covers information of the following Items:

- About rice transplanter
- Benefits of rice transplanter use
- How to purchase a machine?
- Business opportunity
- Risks and business opportunities of rice transplanter.

1.1 Mechanical rice transplanting

Mechanical transplanting of rice is the process of transplanting rice seedlings, which have been grown on tray or mat in nursery, using a machine named rice transplanter. Currently, in conventional manual transplanting operation, 18-24 laborers are required for uprooting seedling from seed bed and transplanting one acre of land. However, by using a self-propelled rice transplanter three persons (1 operator and 2 laborers) can transplant up to four acres of land in a day.

1.2 Benefits of rice transplanter

- Transplanting of seedlings at the age of 15-30 days
- Uniform spacing and optimum plant density
- Less transplanting shock, early seedling vigor and uniform crop establishment
- Less drudgery and health risks for farm laborers
- Less time and labor required for transplanting
- Reduce the problem of labor shortage
- Increases farmers income.

1.3 Different kinds of rice transplanter

There are three kinds of mechanical rice transplanter available e.g. Riding type, Walk-behind type and manual operated (Figures 1,2 and 3). Riding type and self-propelled walk-behind type rice transplanters are powered by gasoline engine.



Fig. 1: Manual



Fig. 2: Walk behind type



Fig. 3: Riding type

1.4 General specifications of walk-behind type rice transplanter

- Model - Different makes and models available (4 row to 6 row)
- Weight (kg) - 180 kg
- Field capacity - 0.17 to 0.2 ha/hr (depends on operator's skill and field size)
- Fuel consumption - 3.5 to 4.25 liter/ha. (depends on operator's skill and field size)
- Fuel - Petrol/Octane
- Transplanting interval (cm) - 6 - 8 inches (15 to 20 cm)
- Hill to hill distance - 9-12 inches (23-30 cm)

1.5 Financial analysis of rice transplanter for custom hiring service business

Rice transplanter custom hiring service business is a seasonal business during the beginning of the rice cultivation season. In a year at least 40 days or 64 ha of transplanting can be done in different rice cultivation seasons, based on the average working capacity of the machine. The estimated working life of a rice transplanter is six years or at least 12 seasons. During operation of rice transplanter, one (01) operator and maximum two (02) laborers are required. Major cost items of rice transplanter custom hiring service business are as follows (Table 1.1)

Table 1.1 Different financial features of rice transplanter for custom hiring service business

Items	Unit	Result
Purchase price of Rice Transplanter	Tk.	350,000.00
Salvage value	Tk.	35,000.00
Operating cost of rice transplanter	Tk./ha	3,471.41
Estimated profit	Tk./ha	2,000.00
Rent out charge of rice transplanter	Tk./ha	6109.32
NPV	Tk.	735881
Benefit-Cost ratio (BCR)	-	1.76
Internal Rate of Return (IRR) (DF 10%)	%	68
Payback period	Years	1.4
Sinking fund payment	Tk./year	40,826.00

On the expiry of the economic life of the rice transplanter, for replacement the local service provider (LSP) or entrepreneur has to deposit an amount of Tk. 40,826.00 in a bank account per year. The estimated rent out charge of the rice transplanter is Tk. 6109 per ha based on the operating cost, sinking fund payment and a revenue amount for the LSP or entrepreneur.

The NPV of the rice transplanter is Tk. 735881 considering 10% interest rate and existing conditions. The NPV of Rice transplanter indicates that rice transplanter

custom hiring service business is financially sound. The NPV also indicates that the rice transplanter custom hiring service business project is financially viable. The IRR value was estimated 68% which shows that the IRR value is greater than the existing bank interest rate and the difference shows that the rice transplanter business is highly profitable for investors compared with deposit money in a bank. The payback period of rice transplanter is determined as 1.4 years.

1.6 Accounting of Rice transplanter custom hiring service business (CHS)

In Bangladesh rice cultivation mainly done in two seasons, i.e. Aman and Boro. In Aus season rice transplanter can also be used for rice cultivation. For two seasons, rice transplanter operation time is about 40 days, where the total rice transplanter operating hour is 320 hr. Besides, two seedling growing seasons are required, where in Aman season 15-20 days and in Boro season 20-30 days are required for seedling raising. For seedling raising, high land is required and approximately 1.5 decimal lands are required to cover 1 ha transplanting. For starting a business one rice transplanter, seedlings, one (01) operator, two (02) laborers, Petrol, Oil, etc. are needed.

- Seedling raising cost: Tk. 5,400 per ha (actual cost basis and farmers will not charge extra)
- Price of the rice transplanter: Tk. 3,50,000
- Total operating cost of rice transplanter for one (01) year including labor and fuel = Tk. 2,22,000
- Total Income from rice transplanter operation business per year including machine replacement deposit = Tk. 3,91,000
- Machine replacement deposit per year = Tk. 41,000
- Total net profit for 40 days of operation in a year (Tk. 2000 per ha basis) = Tk. 1,28,000
- Total revenue for 6 years lifetime of the machine = Tk. 7,68,000

1.7 Custom hiring service condition

When a rice transplanter is available in a village it is automatically publicized to farmers of the village and the locality. A farmer can set his own rule or learn the existing rule of custom hiring business from other service providers. Farmers who willing to rent in the transplanter will communicate with the machine owner or machine owner can give an offer to the farmer for transplanting rice seedling by taking a charge. For communication, neighbor farmers and relatives are primarily be contacted and later on the service provider can gradually spread the service to nearby villagers for business extension. It will not cost extra time and money. In season time, for seedling caring and transplanter operation in the field skilled manpower is required.

1.8 How to purchase a rice transplanter?

More than 5 companies (private business organizations who import agricultural machinery) involved in marketing of rice transplanters. Most of the private companies sell the machine on credit with 12% flat rate interest and take at least 50% down payment. For rice transplanter, the tenure of the credit is maximum of 12 months.

Required documents as follows:

- Prescribed loan form
- National ID
- Photograph
- Guarantor
- Bank check as security
- 50% down payment

Bangladesh Krishi Bank (BKB) and Rajshahi Krishi Unnayan Bank (RAKUB) provide credit for machinery purchase with 9% declining method interest with at least 20% down payment and mortgage of land or other permanent asset as per rule. The tenure of payment of credit is 36 months. Necessary information on bankable proposal are mentioned in Table 1.2 and 1.3.

Table 1.2. Information on bankable proposal

<p>Personal information of the applicant</p> <ul style="list-style-type: none"> ● Photocopy of NID ● Two copies PP size Photo (Attested) ● Nationality certificate by the local Govt. member 	<p>Purpose of the loan</p> <ul style="list-style-type: none"> ● Name of the machine with quantity and brief specification ● Market price of the machine ● Amount of loan 	<p>Asset of the applicant</p> <ul style="list-style-type: none"> ● Type and amount of land ● Currently running project and business ● Others
<p>Information of the mortgaged land</p> <ul style="list-style-type: none"> ● Copy of land khatian ● Tax receipt with original registered document of land ● If succession than copy of original khatian ● For purchased land, original land registration document, Via document, mutation document, current land tax receipt, copy of mouja map ● For auction, tax receipt and land accusation certificate ● For lease, heba document, tax receipt and original document of main land lord ● If the land owned by an under 18 years old person than permission letter from a district judge 	<p>Other types of mortgage (Building, Home, etc.)</p> <ul style="list-style-type: none"> ● Same as land <p>Investigation</p> <ul style="list-style-type: none"> ● Bank will do all necessary investigation and will search for validation of all the submitted information and documents <p>Witness and identifier</p> <ul style="list-style-type: none"> ● Need witness from locality ● Identifier- local govt. chairman 	<p>Cost involve for loan processing</p> <ul style="list-style-type: none"> ● Application form - Tk. 100 ● Commission on loan- Tk. 400@ Tk. 1,00,000 ● Search report cost- Tk. 1000 upto Tk. 5,00,000 and Tk. 2000 for Tk. 5,00,000 to Tk. 15,00,000 and Tk. 3000 above Tk. 15,00,000 ● VAT on commission and search report @ 15% ● CIB report - Tk. 500 for one person and Tk. 1000 for more than one person ● Bank loan form - Tk. 230 (with 15% vat) ● Judicial stamp - Tk. 1600 (100 x 13 and 50 x 6)

On the other hand, a farmer or an entrepreneur can purchase a rice transplanter under the agricultural machinery subsidy program of the government. Department of Agricultural Extension (DAE) is implementing the program. The subsidy on rice transplanter is 50% all over the country and 70% for the coastal and haor regions of the country. Farmers can apply for the subsidy as per DAE rules. The application form is available at the Upazila agriculture office.

Sub-Assistant Agricultural Officers (SAAO) would be of help for collecting and filled in the application. The form is free of cost and after filling in the form, 1 (one) copy of NID's photocopy and two (02) copies of passport size photographs are needed to attach with the form during submission. After getting the approval of subsidy, a farmer or an entrepreneur can purchase a rice transplanter from any DAE enlisted machinery company by paying only 50% or 30% of the machine price depending on the subsidy program and the rest of the selling price will be collected by the machinery company from the subsidy program designated banks.

Table 1.3. Loan payment schedule of Pvt. company/Bank

Loan payment schedule of pvt.company			Loan payment schedule of BKB				
Total price (Tk.)	350000		Total price (Tk.)	350000			
Installment No	12		Installment No	36			
Rate of interest (flat)	12%		Rate of interest (decreasing)	9%			
Downpayment (50%)	175000		Downpayment (20%)	70000			
Principal amount (Tk.)	175000		Principal amount (Tk.)	280000			
Sl. No	Installment amount (Tk.)	Total Due (Tk.)	Sl. No	Installment amount Principal amount (Tk.)	Interest (Tk.)	Monthly Payable amount (Tk.)	Due amount (Tk.)
1	16333.33	179666.67	1	7777.78	2100.00	9877.78	272222.22
2	16333.33	163333.33	2	7777.78	2041.67	9819.44	264444.44
3	16333.33	147000.00	3	7777.78	1983.33	9761.11	256666.67
4	16333.33	130666.67	4	7777.78	1925.00	9702.78	248888.89
5	16333.33	114333.33					
6	16333.33	98000.00					
7	16333.33	81666.67	31	7777.78	350.00	350.00	38888.89
8	16333.33	65333.33	32	7777.78	291.67	291.67	31111.11
9	16333.33	49000.00	33	7777.78	233.33	233.33	23333.33
10	16333.33	32666.67	34	7777.78	175.00	175.00	15555.56
11	16333.33	16333.33	35	7777.78	116.67	116.67	7777.78
12	16333.33	0.00	36	7777.78	58.33	58.33	0.00

1.9 Training, spare parts, repair and maintenance services

Rice transplanter machine operation need trained personnel for successful transplanting of rice seedling. The training activity is time to time arranged by BAU, BARI, BRRI, DAE, NGO's and private business organizations who involve in rice transplanter research and business. Training includes seedling raising, operation of the machine, repair and maintenance.

Importing companies usually offer one year warranty for rice transplanter. The warranty covers scheduled servicing, spare parts and service needed by the machine

during operation. Spare parts beyond the warranty period should buy by the machine owner. Spare parts are available at local selected dealers of company or service center of importer company.

1.10 Women involvement

Rice transplanter custom hiring service business can be done by a woman. She can hire operator and labor for seedling raising and transplanter operation. Besides an entrepreneur, woman participation can be ensured as follows:

- For seedling raising and caring of seedling can be done by women
- Accounting of the business
- Maintenance of rice transplanter i.e. washing and cleaning can be done by women
- Rice transplanter storing and routine maintenance work can be monitored by women

1.11 Risks related to rice transplanter custom hiring service business

Every business has some risks along with profit. In rice transplanter custom hiring service business the following risk factors need to be considered:

- If the number of rice transplanter increases at a given time the rate of income may decrease
- Income may decrease if the quality of the seedling is not good
- Excess rain or early flood can reduce area of transplanting resulting in less income
- It may be hard to recover dues from neighbors and villagers.

1.12 Prospects of rice transplanter custom hiring service business

- As a new business idea there is a good scope of income generation from rice transplanter custom hiring service business
- With the help of Govt. subsidy one can own a rice transplanter by paying only 50% or 30% of the actual price
- Bank loan from BKB is available for purchase a rice transplanter (conditional)
- Rice transplanter business can be operated along with other business/job as it is seasonal and less time required to maintaining the machine.

Chapter 2

Business module on mini-combine harvester custom hiring service

This module covers information of the following items:

- About mini-combine harvester
- Benefits of mini-combine harvester use
- Financial analysis and accounting of Custom Hiring Service (CHS) business
- How to purchase a mini-combine harvester?
- Training, repair and maintenance of mini-combine harvester
- Risks and business opportunities of mini-combine harvester

2.1 Introduction

Combined harvesting-threshing-cleaning-bagging by a small machine is commonly known as mini-combine harvester. In Bangladesh, the paddy harvesting generally includes harvesting, threshing, cleaning and bagging which are labor-intensive and costly. Mini-combine harvester is useful to harvest, thresh, clean and bag of paddy and therefore its adoption in Bangladesh is important for improving production efficiency, reducing costs and minimizing losses. In areas where frequent flash flood and other natural calamities destroy ripen rice crops, combine harvester is the best machine to avoid such massive loss. At such stage, when timeliness of harvesting and threshing operations are critical, appropriate mini-combine harvester is one of the best options for the farmers as it performs several activities in a single operation thus save time, drudgery and labor requirement. However, the initial investment for having a mini-combine harvester is quite high for most of the farmers. Custom hiring service of mini-combine harvester is one of the opportunities for most of the farmers to avoid high initial investment and labor crisis during peak harvesting period.

2.2 Specifications of a mini-combine harvester



Model	4LBZ-110
Dimension (L×W×H) mm	2590×1330×2010
Weight (kg)	950
Header Width (mm)	1100
Forward Speed (km/hr)	1.6~2.8
Capacity (ha/hr)	0.07~0.135
Fuel Consumption (kg/ha)	12~20
Engine Power (hp)	20
Engine Type/ Model	Diesel Engine/ ZS1110
Engine Speed (rpm)	2200
Tyre Type	Crawler

2.3 Benefits of a mini-combine harvester

- Cost saving up to 50-60% over manual harvesting
- Labor saving up to 60-70% over manual harvesting
- Can reduce human drudgery, harvesting time and losses
- Crawler type wheel of mini-combine allows harvesting of paddy in semi-soft soils/clay soils
- Harvesting loss is less than 2% and paddy straws remain unbroken
- Timely harvesting, threshing, cleaning and bagging of rice are possible in a single operation
- Timely harvesting ensures preparation of seed bed and sowing of the next crop
- Mini-combine can also be used for harvesting of wheat.

2.4 Financial analysis of mini-combine harvester for custom hiring service business

Custom hiring service business of mini-combine harvester is seasonal. In a year, mini-combine harvester can be used at least 60 days or 52.80 ha of harvesting. Estimated working life of a mini-combine harvester machine is about 10 years or about 20 seasons. One operator is needed for operating the mini-combine harvester and two (02) laborers are required for preparing paddy field for harvesting and carrying paddy bag after harvesting. Major cost items of mini-combine harvester custom hiring service business are presented in the following Table 2.1.

Table 2.1. Different financial features of mini-combine harvester for custom hiring service business

Items	Unit	Result
Purchasing price of mini-combine harvester	Tk.	650,000
Salvage value of mini-combine harvester	Tk.	65,000
Operating cost of mini-combine harvester	Tk./ha	9562
Rent out charge of mini-combine harvester	Tk/ha	16000
Net Present Value (NPV) at 10% DF	Tk.	2083168
Benefit-Cost Ratio (BCR)	-	1.67
Internal Rate of Return (IRR)	%	68
Payback period	Years	1.46
Sinking Fund Payment (SFP)	Tk./year	38,505
Break Even use	ha/yr	12.45

Based on the economic life of the mini-combine harvester, an entrepreneur needs to save or deposit Tk. 38,505 per year in a bank account, so that he can buy a new mini-combine harvester when the economic life of old mini-combine harvester expires. The estimated rent out charge of the mini-combine harvester is Tk. 16000 per ha based on the operating cost, sinking fund payment for the replacement with a new one and a revenue/profit amount for the custom hiring service provider.

Considering 10% discount rate, the net present value (NPV) of the mini-combine harvester in exiting condition is Tk. 2083168. The NPV of mini-combine harvester indicates that mini-combine harvester is considered financially sound because estimated internal rate of return (IRR) for mini-combine harvester is 68% which is far greater than the bank rate of interest. It indicates that investing on a mini-combine harvester is highly profitable and highly suitable for being a custom-hiring entrepreneur of mini-combine harvester.

The payback period of mini-combine harvester is determined as 1.46 year that means the stream of cash proceeds produced by an investment is equal to the initial expenditure incurred after 1.46 years. The break-even use of the mini-combine harvester is about 12.45 ha per year. It indicates that a mini-combine harvester should operate above 12.45 ha per year to have profit.

2.5 Accounting of mini-combine harvester custom hiring service (CHS) business

In Bangladesh, there are two seasons of paddy cultivation i.e. Aman and Boro. In Aus season, mini-combine harvester can also be used for paddy harvesting. For two seasons, mini-combine harvester operational time is 60 days; whereas, the daily operating hours is about 8 hours and the annual operating hour is about 480 hours. Operating cost and profit of a mini-combine harvester are described below:

- Purchase price of mini-combine harvester = Tk. 650000
- Fixed cost per hectare = Tk. 1987 per ha
- Variable cost per hectare (fuel, oil, operator, labor for paddy bag & straw collection) = Tk. 7575 per ha
- Operational cost of mini-combine harvester (Fixed cost + Variable cost) = Tk. 9562 per ha
- Benefit/rent-out charge = Tk. 16000 per ha
- Deposit for the machine replacement = Tk. 729 per ha
- Profit = Tk. 5709 per ha
- Annual use of mini-combine harvester = 52.80 ha per yr
- Annual benefit/ rent-out charge = Tk. 844800 per ha
- Annual operating cost of mini-combine harvester = Tk. 504887 per yr
- Annual deposit for the machine replacement = Tk. 38505 per yr
- Annual profit = Tk. 301408 per yr

Custom hiring service business of mini-combine harvester requires initial capital investment of Tk. 650000 for machine purchase. For its operation 1 operator and 2 laborers are needed. Annual operating cost of the mini-combine is about Tk. 504887, considering annual use of about 52.80 ha. The operating cost per ha is Tk. 9562. Total annual profit will be about Tk. 301408 after keeping annual deposit Tk. 38505 for machine replacement at the end of 10 years machine usable life (using a sinking fund payment method).

2.6 How to purchase a mini-combine harvester?

More than 5 agricultural machinery companies are importing and marketing of the mini-combine harvester. Most of the private companies are selling mini-combine with a down payment of 50% and the rest on credit with 12% flat rate interest. For a mini-combine harvester, the tenure of the loan is maximum of 12 months.

Following documents are needed during purchase of mini-combine harvester:

- Prescribed loan form
- National ID
- Photograph
- Guarantor
- Bank check as security
- 50% or 30% down payment

Bangladesh Krishi Bank (BKB) and Rajshahi Krishi Unnayan Bank (RAKUB) provide credit for machinery purchase with 9% declining method interest with at least 20% down payment and mortgage of land or other permanent asset as per rule. The tenure of payment of credit is 36 months. Necessary information on bankable proposal are mentioned in Table 2.2 and 2.3.

Table 2.2. Information on bankable proposal

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<p>Information of the mortgaged land</p> <ul style="list-style-type: none"> ● Copy of land khatian ● Tax receipt with original registered document of land ● If succession than copy of original khatian ● For purchased land, original land registration document, Via document, mutation document, current land tax receipt, copy of mouja map ● For auction, tax receipt and land accusation certificate ● For lease, heba document, tax receipt and original document of main land lord ● If the land owned by an under 18 years old person than permission letter from a district judge 	<p>Other types of mortgage (Building, Home, etc.)</p> <ul style="list-style-type: none"> ● Same as land <p>Investigation</p> <ul style="list-style-type: none"> ● Bank will do all necessary investigation and will search for validation of all the submitted information and documents <p>Witness and identifier</p> <ul style="list-style-type: none"> ● Need witness from locality ● Identifier- local govt. chairman 	<p>Cost involve for loan processing</p> <ul style="list-style-type: none"> ● Application form - Tk. 100 ● Commission on loan- Tk. 400@ Tk. 1,00,000 ● Search report cost- Tk. 1000 upto Tk. 5,00,000 and Tk. 2000 for Tk. 5,00,000 to Tk. 15,00,000 and Tk. 3000 above Tk. 15,00,000 ● VAT on commission and search report @ 15% ● CIB report - Tk. 500 for one person and Tk. 1000 for more than one person ● Bank loan form - Tk. 230 (with 15% vat) ● Judicial stamp - Tk. 1600 (100 x 13 and 50 x 6)

On the other hand, a farmer or an entrepreneur can purchase a mini-combine harvester under the agricultural machinery subsidy program of the government. Department of Agricultural Extension (DAE) is implementing the program. The subsidy on mini-combine is 50% all over the country and 70% for the coastal and haor regions of the country. Farmers can apply for the subsidy as per DAE rules. Application form is available at upazilla agriculture office. Community based Sub-Assistant Agricultural Officers (SAAO) would be helped for collecting and filled in application. The form is free of cost and after filled in the form, 1 (one) copy of NID's photocopy and two (02) copies of passport size photographs are needed to attach with the form during submission. After getting approval of subsidy, a farmer or an entrepreneur can purchase a machine from any DAE enlisted machinery company by paying only 50% or 30% of the machine price depending on the subsidy program and the rest of the selling price will be collected by the machinery company from the subsidy program designated banks.

Table 2.3. Loan payment schedule of Pvt. Company and BKB for mini-combine harvester

Loan payment schedule of Pvt. company		Loan payment schedule of BKB	
Total price (Tk.)	650000	Total price (Tk.)	650000
Installment No	12	Installment No	36
Rate of interest(flat)	12%	Rate of interest(flat)	9%
Down payment (50%)	325000	Down payment (20%)	130000
Principal amount (Tk.)	325000	Principal amount (Tk.)	520000

Installment no.	Installment amount (Tk.)	Total Due (Tk.)
1	30333.33	333666.67
2	30333.33	303333.33
3	30333.33	23000.00
4	30333.33	24266.67
5	30333.33	212333.33
6	30333.33	182000.00
7	30333.33	151666.67
8	30333.33	121333.33
9	30333.33	91000.00
10	30333.33	60666.67
11	30333.33	30333.33
12	30333.33	0.00

Sl. No	Installment amount		Monthly Payable amount (Tk.)	Due amount (Tk.)
	Principal amount (Tk.)	Interest (Tk.)		
1	14444.44	3900.00	18344.44	505555.56
2	14444.44	3791.67	18236.11	491111.11
3	14444.44	3683.33	18127.78	476666.67
4	14444.44	3575.00	18019.44	462222.22
↓				
31	14444.44	650.00	10594.44	72222.22
32	14444.44	541.67	14986.11	57777.78
33	14444.44	433.33	14877.78	43333.33
34	14444.44	325.00	14769.44	28888.89
35	14444.44	216.67	14661.11	14444.44
36	14444.44	108.33	14255.78	0.00

2.7 Training, repair and maintenance services

Trained personnel on mini-combine harvester operation are needed for successful harvesting of paddy/wheat. Training programs for the farmers, operators, mechanics and local service providers are arranged by DAE, BARI, BRRI, BAU, NGO's and private business organizations who are involved in mini-combine harvester research and businesses.

Machinery companies provide 1 (one) year warranty of the mini-combine. Warranty covers scheduled servicing, spare parts and service needed during operation. Spare parts to be purchased by the machine owner after the warranty period.

2.8 Women involvement

Custom hiring service provisions of mini-combine harvester are common in the country and women entrepreneurs can operate the business. She can hire operator for the harvesting operation. Besides, a woman entrepreneur can be involved in mini-combine harvester business operation by the following ways:

- During operation, women can help the operator by loading and unloading of paddy bag
- Women can also carry the paddy bag and straw from field to the homestead
- Machine storing and routine maintenance can be taken care-of by women
- Business contact with stakeholders can be done by women

2.9 Risk factors in mini-combine harvester business

Every business has risk along with profit. Mini-combine harvester operation business has also the following risk factors:

- Excess rain or early flood can reduce area of harvesting resulting in less income
- If the number of mini-combine harvester increases in the command area the rate of income may decrease
- Rate of income may decrease without proper utilization of mini-combine harvester.

2.10 Prospects of mini-combine harvester custom hiring services (CHS) business

- Anyone may own a mini-combine harvester by paying only 50% or 30% of the machine price under the government subsidy program
- As a new business idea, mini-combine harvester business can be a good scope of income generation
- Bank loan from Bangladesh Krishi Bank (BKB) is available for purchasing a mini-combine harvester (BKB loan payment schedule is Shown in Table 2.3)
- Mini-combine harvester business can be operated along with other business/job as it is seasonal and required less time for maintaining a machine.

Chapter 3

Business module on reaper custom hiring service

This module covers information of the following items:

- About reaper
- Benefits of reaper use
- Financial analysis and accounting of custom hiring service (CHS) business
- How to purchase a reaper?
- Training, repair and maintenance of reaper
- Risks and business opportunities of reaper

3.1 Introduction

Rice farming is the most important livelihood activity in agriculture and plays a key role in the overall livelihoods of Bangladesh in terms of its contribution to GDP. Rice harvesting vary from region to region with different methods of harvesting. Traditionally people of Bangladesh use different types of local made hand tools for harvesting among them sickle is widely used. Now a days, reaper is introduced at very limited areas. Reaper is very simple in construction and easy to operate and transfer from one land to another. It is suitable for poor and marginal farmers with fragmented land. Small and marginal farmers can afford to buy and use reaper. Reaper is becoming popular among the farmers as it performs hervesting operation, and saves time, labor and drudgery of operation. To avoid initial investment and to over come labor crisis at the peak harvesting period, reaper can also be used as custom hiring service (CHS) basis.

3.2 Specifications of reaper



- Model: VR-120
- Avg. effective field capacity: 55-75 decimal/hr
- Fuel consumption: 3-3.5 liter/ha
- Reaping: possible to 60° angle of inclined crop
- Harvesting field type: dry, wet, or 10 cm-water flooded
- Fuel used: petrol
- Harvesting loss: almost zero
- Forward speed: 60 m/min
- Dimension (L × W × H): (200 × 135 × 110) cm³
- Weight (without engine): 120 kg

3.3 Advantages of reaper

- Cost saving up to 80-90% over manual harvesting
- Labor saving up to 50-60 % over manual harvesting
- Reduce human drudgery, harvesting time and losses
- Possible to harvest in clay soil
- Save time to prepare seed bed and sowing timely for the next crop
- Can be used for wheat harvesting.

3.4 Financial analysis of reaper for custom hiring service business

Custom hiring business of reaper is seasonal. In a year, it can be used about 60 days or 105.60 ha for harvesting. Estimated working life of a reaper is 5 years or at least 10 seasons. Field operation of reaper needs one (01) operator and one (01) extra labor. Major cost items of reaper custom hiring service business are presented in the following Table 3.1:

Table 3.1. Different financial features of reaper custom hiring service business

Items	Unit	Result
Purchases price of reaper	Tk.	1,65,000
Salvage value of reaper	Tk.	16,500
Operating cost of reaper	Tk./ha	1557
Rent out charge of reaper	Tk./ha	4000
Net Present Value (NPV) at 10% DF	Tk.	982498
Benefit-Cost Ratio (BCR)	-	2.59
Internal Rate of Return (IRR)	%	182
Payback period	Years	0.55
Sinking Fund Payment (SFP)	Tk./year	23375
Break Even use	ha/yr	15.60

Based on the economic life of the reaper, an entrepreneur needs to save or deposit Tk. 23,375 per year in a bank account, so that he can buy a new reaper when the economic life of old reaper expires. The estimated rent out charge of the reaper is Tk. 4,000 per ha based on the operating cost, sinking fund payment for the replacement with a new one and a revenue/profit amount for the custom hiring service provider.

Considering 10% discount rate, the net present value (NPV) of the reaper in exiting condition is Tk. 982498. The NPV of reaper indicates that custom hiring service business of reaper is considered financially sound because estimated internal rate of return (IRR) for reaper is 182% which is far greater than the bank rate of interest. It indicates that investing on a reaper is highly profitable and highly suitable for being a custom-hiring entrepreneur.

The payback period of reaper is determined as 0.55 year that means the stream of cash proceeds produced by an investment is equal to the initial expenditure incurred after 1.46 years. The break-even use of the reaper is about 15.60 ha per year. It indicates that a reaper should operate above 15.60 ha per year to have profit.

3.5 Accounting of reaper custom hiring service (CHS) business

In Bangladesh, there are two seasons of paddy cultivation i.e. Aman and Boro. In Aus season, reaper can also be used for paddy harvesting. For two seasons, reaper operational time is 60 days; whereas, the daily operating hours is about 8 hours and the annual operating hour is about 480 hours. Operating cost and profit of a reaper are described below:

- a. Purchase price of reaper = Tk. 165000
- b. Fixed cost per hectare = Tk. 423 per ha
- c. Variable cost per hectare (fuel, oil, operator, labor for paddy bag & straw collection) = Tk. 1134 per ha
- d. Operational cost of reaper (Fixed cost + Variable cost) = Tk. 1557 per ha
- e. Benefit/rent-out charge = Tk. 4000 per ha
- f. Deposit for the machine replacement = Tk. 221 per ha
- g. Profit = Tk. 2222 per ha
- h. Annual use of reaper = 105.60 ha per yr
- i. Annual benefit/ rent-out charge = Tk. 422400 per ha
- j. Annual operating cost of reaper = Tk. 164408 per yr
- k. Annual deposit for the machine replacement = Tk. 23375 per yr
- l. Annual profit = Tk. 234617 per yr

Custom hiring service business of reaper requires initial capital investment of Tk. 1,65000 for machine purchase. For its operation, 1 operator and 1 labor is needed. Annual operating cost of reaper is about Tk. 164408, considering annual use of about 105.60 ha. The operating cost per ha is Tk. 1557. Total annual profit will be about Tk. 234617 after keeping annual deposit Tk. 23375 for machine replacement at the end of 5 years machine usable life (using a sinking fund payment method).

3.6 How to purchase a reaper?

More than 5 agricultural machinery companies are importing and marketing the reaper. Most of the private companies are selling reaper with a down payment of 50% and the rest on credit with 12% flat rate interest. The tenure of the loan is maximum of 12 months. Following documents are needed during purchase of reaper:

- Prescribed loan form
- National ID
- Photograph
- Guarantor
- Bank check as security
- 50% or 30% down payment

Bangladesh Krishi Bank (BKB) and Rajshahi Krishi Unnayan Bank (RAKUB) provide credit for machinery purchase with 9% declining method interest with at least 20% down payment and mortgage of land or other permanent asset as per rule. The tenure of payment of credit is 36 months. Necessary information on bankable proposal are mentioned in Table 3.2 and 3.3.

Table 3.2. Information on bankable proposal

<p>Personal information of the applicant</p> <ul style="list-style-type: none"> ● Photocopy of NID ● Two copies PP size Photo (Attested) ● Nationality certificate by the local Govt. member 	<p>Purpose of the loan</p> <ul style="list-style-type: none"> ● Name of the machine with quantity and brief specification ● Market price of the machine ● Amount of loan 	<p>Asset of the applicant</p> <ul style="list-style-type: none"> ● Type and amount of land ● Currently running project and business ● Others
<p>Information of the mortgaged land</p> <ul style="list-style-type: none"> ● Copy of land khatian ● Tax receipt with original registered document of land ● If succession than copy of original khatian ● For purchased land, original land registration document, Via document, mutation document, current land tax receipt, copy of mouja map ● For auction, tax receipt and land accusation certificate ● For lease, heba document, tax receipt and original document of main land lord ● If the land owned by an under 18 years old person than permission letter from a district judge 	<p>Other types of mortgage (Building, Home, etc.)</p> <ul style="list-style-type: none"> ● Same as land <p>Investigation</p> <ul style="list-style-type: none"> ● Bank will do all necessary investigation and will search for validation of all the submitted information and documents <p>Witness and identifier</p> <ul style="list-style-type: none"> ● Need witness from locality ● Identifier- local govt. chairman 	<p>Cost involve for loan processing</p> <ul style="list-style-type: none"> ● Application form - Tk. 100 ● Commission on loan- Tk. 400@ Tk. 1,00,000 ● Search report cost- Tk. 1000 upto Tk. 5,00,000 and Tk. 2000 for Tk. 5,00,000 to Tk. 15,00,000 and Tk. 3000 above Tk. 15,00,000 ● VAT on commission and search report @ 15% ● CIB report - Tk. 500 for one person and Tk. 1000 for more than one person ● Bank loan form - Tk. 230 (with 15% vat) ● Judicial stamp - Tk. 1600 (100 x 13 and 50 x 6)

On the other hand, a farmer or an entrepreneur can purchase a reaper under the agricultural machinery subsidy program of the government. Department of Agricultural Extension (DAE) is implementing the program. The subsidy on reaper is 50% all over the country and 70% for the coastal and haor regions of the country. Farmers can apply for the subsidy as per DAE rules. Application form is available at upazilla agriculture office. Community based Sub-Assistant Agricultural Officers (SAAO) would be of help for collecting and filled in application. The form is free of cost and after filled in the form, 1 (one) copy of NID photocopy and two (02) copies of passport size photographs are needed to attach with the form during submission. After getting approval of subsidy, a farmer or an entrepreneur can purchase a machine from any DAE enlisted machinery company by paying only 50% or 30% of the machine price depending on the subsidy program and the rest of the selling price will be collected by the machinery company from the subsidy program designated banks.

Table 3.3. Loan payment schedule of BKB for reaper

Total price (Tk.)	165000
Installment No	36
Rate of interest (decreasing)	9%
Down payment (20%)	33000
Principal amount (Tk.)	132000

Sl. No.	Installment amount (Tk.)		Payable amount (Tk.) (Monthly installment)	Due amount (Tk.)
	Principal amount	Interest		
1.	3666.67	990.00	4656.67	128333.33
2.	3666.67	962.50	4629.17	124666.67
3.	3666.67	935.00	4601.67	121000.00
4.	3666.67	907.50	4574.17	117333.33
5.	3666.67	880.00	4546.67	113666.67
6.	3666.67	852.50	4519.17	110000.00
7.	3666.67	825.00	4491.67	106333.33
8.	3666.67	797.50	4464.17	102666.67
9.	3666.67	770.00	4436.67	99000.00
10.	3666.67	742.50	4409.17	95333.33
11.	3666.67	715.00	4381.67	91666.67
12.	3666.67	687.50	4354.17	88000.00
13.	3666.67	660.00	4326.67	84333.33
14.	3666.67	632.50	4299.17	80666.67
15.	3666.67	605.00	4271.67	77000.00
16.	3666.67	577.50	4244.17	73333.33
17.	3666.67	550.00	4216.67	69666.67
18.	3666.67	522.50	4189.17	66000.00
19.	3666.67	495.00	4161.67	62333.33
20.	3666.67	467.50	4134.17	58666.67
21.	3666.67	440.00	4106.67	55000.00
22.	3666.67	412.50	4079.17	51333.33
23.	3666.67	385.00	4051.67	47666.67
24.	3666.67	357.50	4024.17	44000.00
25.	3666.67	330.00	3996.67	40333.33
26.	3666.67	302.50	3969.17	36666.67
27.	3666.67	275.00	3941.67	33000.00
28.	3666.67	247.50	3914.17	29333.33
29.	3666.67	220.00	3886.67	25666.67
30.	3666.67	192.50	3859.17	22000.00
31.	3666.67	165.00	3831.67	18333.33
32.	3666.67	137.50	3804.17	14666.67
33.	3666.67	110.00	3776.67	11000.00
34.	3666.67	82.50	3749.17	7333.33
35.	3666.67	55.00	3721.67	3666.67
36.	3666.67	27.50	3694.17	0.00

3.7 Training, repair and maintenance services

Trained personnel on reaper operation are needed for successful harvesting of rice/wheat. Training programs for the farmers, operators, mechanics and local service providers are arranged time to time by BARI, BRRI, DAE, BAU, NGO's and private business organizations who are involved in reaper research and businesses.

Business organizations give 1 (one) year warranty. Warranty covers scheduled servicing, spare parts and service needed during operation. Spare parts would be purchased by the machine owner after the warranty period.

3.8 Women involvement

Reaper business operation on custom hiring service (CHS) basis can be done by women. She can hire operator for harvesting operation. Besides be an entrepreneur, women participation can be involved in reaper business operation by the following ways:

- Women can operate the reaper
- Women can carry the straw from field to homestead after reaping
- Machine storing and routine maintenance can be done by women
- Business contact with stakeholders can be done by women

3.9 Risk factors in reaper custom hiring business

Every business has some risks along with profit. In reaper custom hiring business has also the following risk factors:

- Excess rain or early flood can reduce area of harvesting resulting in less income
- If the number of reaper increases at that time the rate of income may decrease
- Income may decrease without proper capacity utilisation of the reaper

3.10 Prospects of reaper custom hiring services (CHS) business

- Anyone may own a reaper by paying only 50% or 30% amount under the government subsidy program
- As a new business idea, reaper business can be a good scope for income generation
- Bank loan from Bangladesh Krishi Bank (BKB) is available for purchasing reaper (BKB loan payment schedule is attached in Table 3.3)
- Reaper business can be operated along with other business/job as it is seasonal and requires less time for maintaining a machine.

Chapter 4

Business module on seed planter custom hiring service

This module covers information of the following items:

- About seed planter
- Benefits of seed planter use
- About Conservation tillage
- Financial analysis and accounting of custom hiring service business
- How to purchase a seed planter?
- Training, repair and maintenance of seed planter
- Risks and business opportunities of seed planter

4.1 Introduction

At present two-wheeled tractors (commonly called power tillers) are using extensively in cultivation of land in Bangladesh. About 90% of cultivated land is prepared by 0.7 million two-wheeled tractors. Land is prepared by 3-4 passes of tilling with rotary tiller followed by laddering. Seed planter machines such as Power tiller operated seeder (PTOS), strip till planter and zero till planter are used for shallow tilling followed by seeding and seed covering in a single pass which save about 60% fuel. PTOS is an appropriate technology which can utilize residual soil moisture for crop establishment, reduce turnaround time, cost reduction and manage crop residue properly. Seed Planters are often considered as conservation agriculture (CA) machinery.

4.2 Advantages of using seed planter

- It is manufactured in local workshop
- It can be operated in small fragmented land and easily transportable
- One machine can be operated (by adjusting) with different conservation tilling methods
- Reduce turnaround time (7-9 days)
- Seeds can be sown at uniform depth
- It can save 60% fuel and 67 % seeding cost
- Yield increases by up to 20%
- Environment friendly as it reduces 44% carbon emission
- Small farmers can be economically benefited by custom hiring service business.

4.3 What is conservation agriculture?

Conservation Agriculture (CA) is a concept for resource-saving crop production that strives to achieve acceptable profits together with high and sustained production levels conserving the environment.

4.3.1 Advantages of using seed planter (CA machinery)

- Minimal mechanical soil disturbance
- Retention of adequate levels of crop residues on the soil surface
- Use of proper and profitable crop rotations
- Environment friendly (Less carbon dioxide emission).

4.3.2 Conservation tillage

It is disturbing the soil to the minimum extent and leaving crop residues on the soil. It includes minimum and zero tillage which can reduce soil loss up to 99% over conventional tillage. In most cases, it reduces soil by 50% over conventional tillage.

4.3.3 Tillage methods of conservation agriculture

- Single pass shallow tillage/minimum tillage
- Strip tillage
- Zero tillage
- Bed planting

4.4 Types of seed planter (CA machinery)

- Power tiller operated seeder (PTOS)
- Strip till planter
- Zero till planter
- Bed Planter

4.5 Machine description

Seed planter machine has basically two main unit:

- Power unit: Power tiller (12-16 hp) use as driving unit.
- Seeding unit: Locally made seed planter which is hitched with power tiller.

4.6 Specifications of seed planter

Dimension	: 720 mm×1320 mm×700 mm
Weight	: 167 kg
Number of rotary blades	: 48
Power requirement	: Power tiller (9-12 kW)
Number of rows	: 6 (line number adjustable)
Row spacing	: 200 mm (adjustable)
Normal working speed	: 2.0-3.5 km/h
Maximum speed	: 9.40 km/h
Working width	: 1200 mm
Normal seeding depth	: 50-60 mm
Type of seed meter	: Flute type/inclined plate type
Seed box capacity	: 20 kg
Speed of blade	: 480-500 rpm
Price of the seeder	: Tk. 190000.00 (US\$2375) (With 9 kW Power tiller)



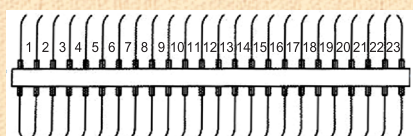
Power unit



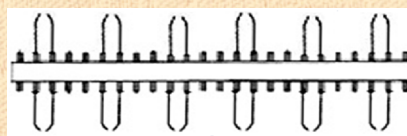
Tilling and seeding unit

4.7 Different working parts of seed planter

- | | | |
|----------------------------|------------------------|---------------------------------|
| 1. Cutter blade | 5. Seed "On-Off" lever | 9. Rubber guard |
| 2. Roller | 6. Seed tube | 10. Roller bearing box |
| 3. Seed box | 7. Roller bar | 11. Tillage depth control lever |
| 4. Seed rate control lever | 8. Rotavator chain box | |



Arrangement of tynes for PTOS



Arrangement of tynes(6 rows) for strip tillage

4.8 Field performance

- Crops: wheat, maize, jute, paddy, oil seeds and pulses
- Field capacity: 0.09-0.12 ha/h (20-30 decimal/h)
- Field efficiency: 75%
- Operating cost: 2500 Tk/ha by seeder (6000 Tk/ha by conventional method)

4.9 Financial analysis of seed planter for custom hiring service business

The salient features of seed planter custom hiring service business are shown in Table 4.1.

Table 4.1. Salient features of seed planter custom hiring service business

Items	Unit	Price
A. FIXED COST		
Purchase price (P) of seed planter	Tk.	70,000
Purchase price (P) of Power tiller (16 hp)	Tk.	1,20,000
Depreciation	Tk/year	35,100
Total fixed cost	Tk/year	47,151
B. VARIABLE COST		
Fuel cost (Diesel)	Tk/year	32,760
Lubrication (15% of fuel cost)	Tk/year	4,914
R & M (3.5% of purchase price)	Tk/year	6,825
Labour/operator cost	Tk/year	36,000
Total variable cost	Tk/year	80,499
C. Total annual operating cost (A+B)	Tk/year	1,27,650
Economic life of machine	year	5
Average operation time	day/year	45
Field capacity of machine	ha/hour	0.10
Annual use in area	hectare/year	36
Hiring charge	Tk/ha	5,976 (800 Tk/Bigha)
D. Gross Return	Tk/year	2,15,136
E. Net Return (D-C)	Tk/year	87,486
Benefit cost ratio (BCR)	-	1.72
Internal rate of return (IRR)	%	66
Payback period	Years	1.45

The total cost of seed planter operation at farm level comprises of variable cost (VC) and fixed cost (FC). FC included the machine cost and VC includes the costs of fuel and oil, operator's salary, repair, maintenance, spare parts, and miscellaneous expenses. Depreciation of seed planter and interest on investment are taken as fixed cost.

The financial analysis is computed from the viewpoint of machine owner. It is found that the total cost of operation of seed planter is Tk. 127650. The results indicate that investment on seed planter is highly profitable. The result shows that the BCR for seed planter is 1.36 that is higher than unity. The NPV of seed planter in existing condition is Tk. 391379. The NPV indicates that seed planter is considered financially sound and the business is said financially viable because IRR (66%) of seed planter is greater than the bank interest rate (14%). Payback period is 1.45 years. The area under land preparation by seed planter operations per year is 36 ha. Again, the custom hiring charge of seed planter is Tk. 5976 per hectare. Based on this information, the annual gross income received from seed planter service is worked out. The average gross income received by a LSP or machine owner is Tk. 215136 per year. The annual net returns over total cost and VC are calculated as Tk. 87486, Tk. 127650 and Tk. 80499, respectively. So, Total profit of a LSP or machine owner is 87486 Tk/year.

4.10 Questions to be addressed for assessing feasibility of a custom hiring service business

- Whom are the potential customers and how many are there in the local area?
- What are the main farming constraints that are faced and would it be possible to solve them by hiring the appropriate service?
- Can the service be effectively and efficiently supplied by small-scale farmer entrepreneurs?
- What are the available time windows for such work in the local area?
- Can complementary services be offered to create a hiring service job market more uniformly throughout the year?
- Are there any competitors offering similar services?
- What do they charge?
- What would be the enterprise cost? Can it be competitive?
- What are the strengths and weaknesses of the enterprise compared with the competition?

4.11 Business strategy of custom hiring service business of seed planter

Custom hiring can be a good choice when there is a need for high-cost and/or specialized machinery and equipment for a short time. By offering services to other farmers, custom operators can spread the cost of the machinery and equipment over large land areas. Custom hiring is also attractive when labor is scarce. In some areas it is possible for landowners to custom hire the entire operation from tillage and planting to harvest and delivery. Farmers with excess machinery capacity and labor can do custom hiring service to stay fully employed and to keep their machinery running. There is a wide variation in respect of hiring charges being charged by different societies for particular type of machinery. In Bangladesh mostly hiring charge of power tiller varies from 4500 to 5000 Tk. per acre. But a farmer can charge 2400 to 3000 Tk. per acre for hiring of seed planter.

4.12 Identification of profit/loss making machines

The profit/loss that machine results is depends upon the annual use of the machine. Higher the annual usage lower will be the operating cost, resulting in higher returns from the machine

4.13 How to purchase a seed planter?

More than 5 agricultural machinery companies are manufacturing, importing and marketing the seed planter. Most of the private companies are selling seed planter with a down payment of 50% and the rest on credit with 12% flat rate interest. The tenure of the loan is maximum of 12 months. Following documents are needed during purchase of seed planter:

- Prescribed loan form ● National ID ● Photograph
- Guarantor ● Bank check as security ● 50% or 30% down payment

Bangladesh Krishi Bank (BKB), Rajshahi Krishi Unnayan Bank (RAKUB) provide credit for machinery purchase with 9% declining method interest with at least 20% down payment and mortgage of land or other permanent asset as per rule. The tenure of payment of credit is 36 months. Necessary information on bankable proposal are mentioned in Table 4.2 and 4.3.

Table 4.2. Information on bankable proposal

<p>Personal information of the applicant</p> <ul style="list-style-type: none"> ● Photocopy of NID ● Two copies PP size Photo (Attested) ● Nationality certificate by the local Govt. member 	<p>Purpose of the loan</p> <ul style="list-style-type: none"> ● Name of the machine with quantity and brief specification ● Market price of the machine ● Amount of loan 	<p>Asset of the applicant</p> <ul style="list-style-type: none"> ● Type and amount of land ● Currently running project and business ● Others
<p>Information of the mortgaged land</p> <ul style="list-style-type: none"> ● Copy of land khatian ● Tax receipt with original registered document of land ● If succession than copy of original khatian ● For purchased land, original land registration document, Via document, mutation document, current land tax receipt, copy of mouja map ● For auction, tax receipt and land accusation certificate ● For lease, heba document, tax receipt and original document of main land lord ● If the land owned by an under 18 years old person than permission letter from a district judge 	<p>Other types of mortgage (Building, Home, etc.)</p> <ul style="list-style-type: none"> ● Same as land <p>Investigation</p> <ul style="list-style-type: none"> ● Bank will do all necessary investigation and will search for validation of all the submitted information and documents <p>Witness and identifier</p> <ul style="list-style-type: none"> ● Need witness from locality ● Identifier- local govt. chairman 	<p>Cost involve for loan processing</p> <ul style="list-style-type: none"> ● Application form - Tk. 100 ● Commission on loan- Tk. 400@ Tk. 1,00,000 ● Search report cost- Tk. 1000 upto Tk. 5,00,000 and Tk. 2000 for Tk. 5,00,000 to Tk. 15,00,000 and Tk. 3000 above Tk. 15,00,000 ● VAT on commission and search report @ 15% ● CIB report - Tk. 500 for one person and Tk. 1000 for more than one person ● Bank loan form - Tk. 230 (with 15% vat) ● Judicial stamp - Tk. 1600 (100 x 13 and 50 x 6)

On the other hand, a farmer or an entrepreneur can purchase a seed planter under the agricultural machinery subsidy program of the government. Department of Agricultural Extension (DAE) is implementing the program. The subsidy on seed planter is 50% all over the country and 70% for the coastal and haor regions of the country. Farmers can apply for the subsidy as per DAE rules. Application form is available at upazilla agriculture office. Community based Sub-Assistant Agricultural Officers (SAAO) would be of help for collecting and filled in application. The form is free of cost and after filled in the form, 1 (one) copy of NID photocopy and two (02) copies of passport size photographs are needed to attach with the form during submission. After getting approval of subsidy, a farmer or an entrepreneur can purchase a machine from any DAE enlisted machinery company by paying only 50% or 30% of the machine price depending on the subsidy program and the rest of the selling price will be collected by the machinery company from the subsidy program designated banks.

Table 4.3. Loan payment schedule of Pvt. company/Bank

Loan payment schedule of Pvt. company			Loan payment schedule of BKB or RAKUB			
Total price (Tk.)	190000		Total price (Tk.)	190000		
No. of Installment	12		No. of Installment	36		
Rate of interest(flat)	12%		Rate of interest (decreasing)	9%		
Down payment (50%)	95000		Down payment (20%)	38000		
Principal amount	95000		Principal amount (Tk.)	152000		
Total payable amount (Tk.)	106400					
Sl. No	Installment amount (Tk.)	Total Due (Tk.)	Sl. No	Installment amount (Tk.)	Monthly Payable amount (Tk.)	Due amount (Tk.)
1	8866.67	97533.33	1	4222.22	1140.00	5362.22
2	8866.67	88666.67	2	4222.22	1108.33	5330.56
3	8866.67	79800.00	3	4222.22	1076.67	5298.89
4	8866.67	70933.33	4	4222.22	1045.00	5267.22
5	8866.67	62066.67				
6	8866.67	53200.00	30	4222.22	221.67	4443.89
7	8866.67	44333.33	31	4222.22	190.00	4412.22
8	8866.67	35466.67	32	4222.22	158.33	4380.56
9	8866.67	26600.00	33	4222.22	126.67	4348.89
10	8866.67	17733.33	34	4222.22	95.00	4317.22
11	8866.67	8866.67	35	4222.22	63.33	4285.56
12	8866.67	0.00	36	4222.22	31.67	4253.89
						0.00



4.14 Training, repair and maintenance services

Trained personnel on seed planter operation are needed for successful seed planting. Training programs for the farmers, operators, mechanics and local service providers are arranged time to time by BARI, BRRI, DAE, BAU, NGO's and private business organizations who are involved in seed planter research and businesses.

Business organizations give 1 (one) year warranty. Warranty covers scheduled servicing, spare parts and service needed during operation. Spare parts would be purchased by the machine owner after the warranty period.

4.15 Women participation

seed planter business operation as custom hiring service basis can be done by woman. She can hire operator and labour for machine operation. Besides an entrepreneur woman participation can be as follows:

- Business contact with stakeholders can be done by women
- Accounting of the business
- Purchasing fuel, oil, lubricant, spare parts during peak season can be done by women
- Cleaning, storing and routine maintenance work can be monitored by women.

4.16 Risks related to seed planter custom hiring service business

Seed planter custom hiring service business the following risk factors may consider:

- If the number of increase at that time the rate of income may decrease
- Rate of income may decrease if the machine quality is not good
- Unavailability of skilled operator, mechanic and spare parts may decrease income
- Excess rain, drought or flash flood can hamper of crop planting resulting less income
- It may be hard to recover the due amount of work from neighbors and village people.

4.17 Prospects of seed planter custom hiring business

- There is a good scope of income generation from seed planter through custom hiring service business
- With the help of GoB facility, one can own seed planter by paying 50% or 70% amount
- Bank loan from BKB or BRKB is also available for purchase seed planter at a 5% rate per annum
- seed planter custom hiring service business can be operated along with other business/job as it is seasonal and less time required for maintain machine.

Appendix-I

Name and address of some farm machinery manufacturers/importers

Sl. No	Owner name	Company name and address	Phone and E-mail
1	Md. Mahbubur Rahman Khan Proprietor	Mahabub Engineering Workshop BSCIC area, Jamalpur	01711-23 7785 mahbub_jam@ yahoo.com
2	Poritosh Kumar Malo Proprietor	RK Metal Topakhola, Faridpur	01710-928977 rkmetal77@gmail.com
3	Alimul Ehsan Chowdhury Managing Director	Alim Industries Limited BSCIC, Gotatikor, Kodomtoli, Sylhet-3100	01713-328796 0821-840662 info@alimindustriesltd.com
4	Engg. SadidJamil Managing Director	The Metal Private Limited PBL Tower (14 floor), 17 North Kamal Ataturk Avenue Gulshan-2, Dhaka-1212	01713-164269 8835006 info@metalbd.biz
5	YasirIbnAsab Product manager	ACI Motors Limited 245, Tejgaon Industrial Area, Dhaka-1208	01755-551203 88-78603 info@aci-bd.com
6	Md. Shah AlamSikder Proprietor	Alam Engineering Works 25, VajohoriSaha Road, Wari, Dhaka-1100	01711-356055
7	Md. Waliullah Proprietor	Janata Engineering, Sarojganj, Chuadanga	01711-960861 janataengineering786 @mail.com
8	Ashfaqahmed Manager (Operation)	RFL Group ProgotiSaroni, Middle Badda, Dhaka	01992661757

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Appropriate Scale Mechanization Innovation Hub (ASMIH)-Bangladesh

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